

1. Find the next three terms of the sequence: 1, 5, 9, 13, 17, 21

Simplify (PEMDAS):

2.  $6 - 2 \cdot 8 \div 4 + 4$   
 $6 - 16 \div 4 + 4$   
 $6 - 4 + 4$   
 $+2 + 4 = 6$

3.  $(2)(-4)(5)$   
 $-8(5)$   
 $-40$

4.  $\frac{12}{-3}$   
 $-4$

5.  $6 - 4x + 7x - 1$   
 $6 - 1 - 4x + 7x$   
 $5 + 3x$

Evaluate if  $x = 2$  and  $y = -3$

6.  $5x + y$   
 $5(2) + (-3)$   
 $10 + (-3) = 7$

7.  $3x - 4y$   
 $3(2) - 4(-3)$   
 $6 + 12 = 18$

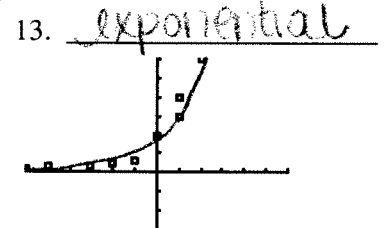
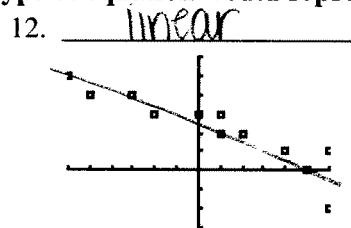
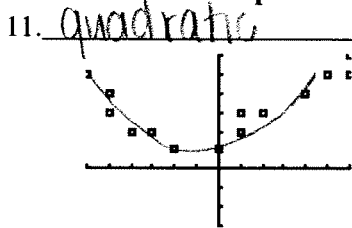
8.  $-y + 15$   
 $-(-3) + 15$   
 $+3 + 15 = 18$

9.  $-7x^2 + 3x$   
 $-7(2^2) + 3(2)$   
 $-7(4) + 3(2)$   
 $-28 + 6 = -22$

10. What are the 3 types of functions (equations) we studied this year?

A. linear B. exponential C. quadratic

Below are 3 scatter plots. Write which type of equation would represent the best fit.



Tell what type of equation is shown.

14.  $y = 3x^2 + 2x - 1$   
quadratic

15.  $y = 4x + 3$   
linear

16.  $y = 2(1 + 0.3)^x$   
exponential

Solve the following linear equations:

17.  $x - 5 = -4$   
 $+5 \quad +5$   
 $x = 1$

18.  $3x - 19 = 32$   
 $+19 \quad +19$   
 $3x = 51$   
 $\frac{3x}{3} = \frac{51}{3}$   
 $x = 17$

19.  $5x - 4 = -7x + 32$   
 $+7x \quad +7x$   
 $12x - 4 = 32$   
 $+4 \quad +4$   
 $12x = 36$   
 $\frac{12x}{12} = \frac{36}{12}$   
 $x = 3$

20.  $23 - 8x = 5(x + 2)$   
 $23 - 8x = 5x + 10$   
 $-10 \quad +8x \quad +8x \quad -10$   
 $13 = 13x$   
 $\frac{13}{13} = \frac{13x}{13}$   
 $1 = x$

21.  $2 + 3(4x - 1) = 8x + 11$   
 $2 + 12x - 3 = 8x + 11$   
 $-8x \quad -8x$   
 $4x - 1 = 11$   
 $+1 \quad +1$   
 $4x = 12$   
 $\frac{4x}{4} = \frac{12}{4}$   
 $x = 3$

22.  $4 \cdot \frac{1}{4}x = 12 \cdot 4$   
 $x = 48$

23.  $\frac{3}{10} = \frac{-x}{5}$   
 $-10x = 15$   
 $\frac{-10x}{-10} = \frac{15}{-10}$   
 $x = -1.5$

24. You join a magazine club. You pay a fee of \$5 a month plus \$.50 for every magazine you order. Find the equation of the line that models this situation, using  $y$  for the total cost to belong to the club and  $x$  for the number of magazines you order.

$y = mx + b$   
 charge      start

$y = .50(x) + 5$

Solve the following systems of equations.

Substitution

25.  $15x - 5y = 30$   
 $y = 2x + 3$   
 $y = 2(9) + 3$   
 $18 + 3$   
 $y = 21$   
 $(9, 21)$

*sub.*  
 $15x - 5(2x + 3) = 30$   
 $15x - 10x - 15 = 30$   
 $5x - 15 = 30$   
 $5x = 45$   
 $x = 9$

Elimination/combinations (adding them together)

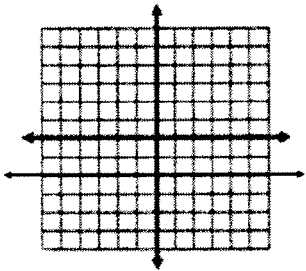
26.  $x + y = 5$   
 $-x + y = 3$   
 $2y = 8$   
 $y = 4$   
 $x + 4 = 5$   
 $-4 -4$   
 $x = 1$   
 $(1, 4)$

**SLOPE** - find the slopes of the graphs, equations, scenarios, and two points.

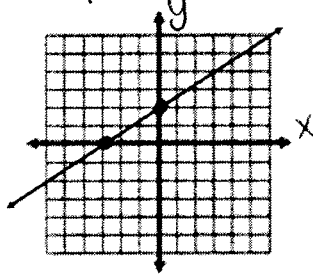
A line could have the following types of slopes: positive, negative, zero, or undefined.

Match the types of slopes with the graphs below.

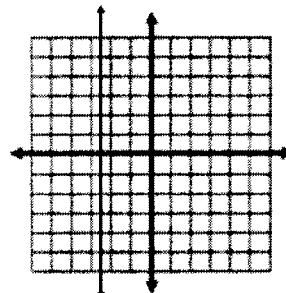
27. zero



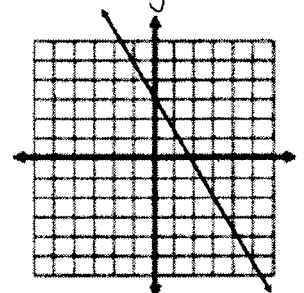
28. positive



29. undefined



30. negative



31. What is the x and y intercept for problem #28? x-intercept = -3 y-intercept = 2

Find the slope of the lines that contain these points. Remember the slope formula  $m = \frac{y_2 - y_1}{x_2 - x_1}$

32.  $(-3, -2)$   $(-1, 8)$   
 $+10$   
 $+2$   
 $\frac{10}{2} = 5$

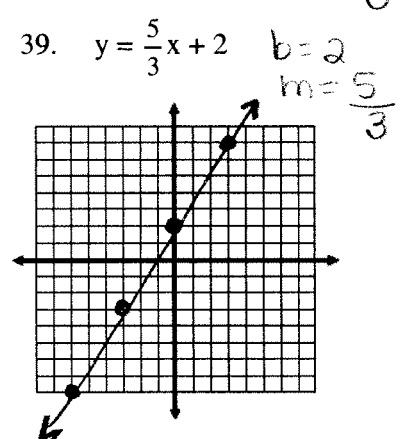
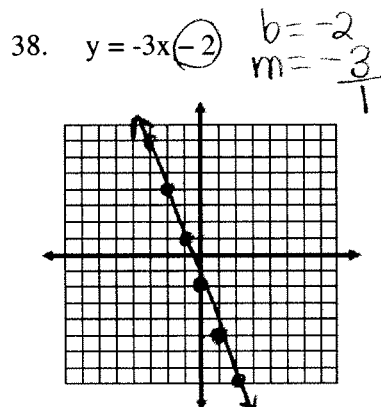
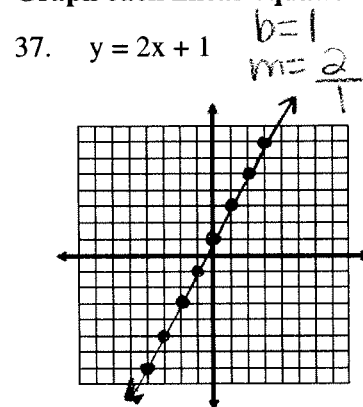
33.  $(2, -8)$   $(-5, -1)$   
 $+7$   
 $-7$   
 $\frac{7}{-7} = -1$

34.  $(-1, -2)$   $(-1, 8)$   
 $+10$   
 $+0$   
 $\frac{10}{0}$   
undefined

35.  $(11, 5)$   $(9, 5)$   
 $+0$   
 $-2$   
 $-2$   
 $\frac{0}{-2} = 0$

36. Find the slope of this equation (remember you have to put it into slope-intercept form):  $4x + 3y = 12$   
 $y = mx + b$   
 $3y = -\frac{4}{3}x + \frac{12}{3}$   
 $y = -\frac{4}{3}x + 4$   
 slope =  $m = -\frac{4}{3}$

Graph each linear equation.



# Algebra Review #2 Equations, Percents, and Data

Name Key

Hr

1. Which point lies on the line  $x + 3y = 12$ ? Circle one:

\*You can test by plugging in the x- and y-values.

$x \ y$   
 $(4, 0)$   
 $4 + 3(0)$   
 $4 + 0$   
 $4$

$x \ y$   
 $(2, 3)$   
 $2 + 3(3)$   
 $2 + 9$   
 $11$

$x \ y$   
 $(0, 4)$   
 $0 + 3(4)$   
 $0 + 12$   
 $12$

2. A plumber charges \$50 for a house call plus \$75 an hour for any work that needs to be done.

Write an equation that would represent this data. Use y for cost and x for hours.

$y = 75 \cdot x + 50$

If the bill came to \$425, how many hours did the plumber charge you for the work?

total  
 $425 = 75 \cdot x + 50$   
 $375 = 75 \cdot x$

$x = 5 \text{ hours}$

x	0	1	2	3
y	30	40	50	60

+10 +10 +10

3. Find the equation that represents this table:

$y = 10x + 30$

change start  $x=0$

4. Write an equation of a line that passes through the point (5, -2) and has a slope of 4

$y = 4x + b$   
 $-2 = 4(5) + b$   
 $-2 = 20 + b$   
 $-22 = b$

$x \ y$   
 $y = 4x - 22$

Find the equation of the line that goes through these two points: (You can use the formula)  $y - y_1 = m(x - x_1)$

5.  $(4, 5) (2, 1)$   
 $m = \frac{-4}{-2} = 2$   
 $y = 2x + b$   
 $1 = 2(2) + b$   
 $1 = 4 + b$   
 $b = -3$

$y = 2x - 3$

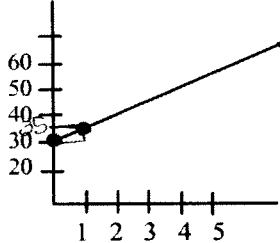
6.  $(2, 5) (-6, 9)$   
 $m = \frac{4}{-8} = -\frac{1}{2}$

$y = -\frac{1}{2}x + b$   
 $y - 5 = -\frac{1}{2}(x - 2)$   
 $y - 5 = -\frac{1}{2}x + 1$   
 $y = -\frac{1}{2}x + 6$

7. Write any equation of a line parallel to  $y = \frac{1}{2}x + 3$  change to any.

$y = \frac{1}{2}x + 8$

Amount a person earns (in thousands) per year of work for a company



8. What would be a good equation of a line for this?

a.  $y = -5x + 2$  b.  $y = -5x + 30$   
 c.  $y = 5x + 30$  d.  $y = 5x + 2$

positive slope

9. Based on your answer to problem number 8, Predict how much you would earn in 8 years.

$y = 5(8) + 30$   
 $y = 40 + 30$   
 $y = 70 \text{ thousand}$

**Percents:**  $\frac{\text{is}}{\text{of}} = \frac{\%}{100}$

10. 30 is 15 % of 120  
 $\frac{30}{120} = \frac{\%}{100}$   $\cdot 15(100) = \%$

11. 7% of 40  $\frac{x}{40} = \frac{7}{100}$   
 $x = 2.8$   $x = 280/100$

12. 24 is 40% of what number?

$\frac{24}{x} = \frac{40}{100}$   
 $\frac{x}{24} = \frac{100}{40}$   
 $x = \frac{2400}{40}$   
 $x = 60$

13. On your last test your score was 64 out of 80. What was your percent?

$\frac{64}{80} = .8 \times 100$   $80\%$

**Define the following terms.**

14. Mean: the average - add all numbers and divide by how

15. Median: <sup>many there are</sup> the middle number when listed in order

16. Mode: the one that shows up most

**Solve and graph (on a number line) the following inequalities:**

17.  $x + 5 \leq 3$

$-5 -5$

$x \leq -2$



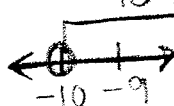
18.  $-7 - x < 3$

$+7 +7$

$-x < 10$

$-10 < x$

trade FLIP sides



19.  $2x + 3 \geq 6x - 1$

$+1 +1$

$2x - 12 \geq 6x - 1$

$-4x \geq -12$

$x \leq 3$



**Solve the following compound inequalities:**

20.  $5 < 3x - 1 \leq 17$

$+1 +1 +1$

$\frac{6 < 3x \leq 18}{3 \quad 3 \quad 3}$

$2 < x \leq 6$

21.  $3x - 4 < 20$  OR  $-2x - 1 < -21$

$+4 +4$

$\frac{3x < 24}{3}$

$x < 8$

$\frac{-2x < -20}{-2}$

$x > 10$

22. The fastest time recorded for the 100m dash is 9.58 seconds.

Write an inequality for all the other times. Use "t" for all the other times.

$t > 9.58$

**Solve the following absolute value equations.**

23.  $|x| = 19$

$x = 19$  and  $x = -19$

24.  $|x - 7| = 4$

$x - 7 = 4$

$x = 11$

$x - 7 = -4$

$x = 3$

25.  $|2x + 1| = 9$

$2x + 1 = 9$

$2x = 8$

$x = 4$

$2x + 1 = -9$

$2x = -10$

$x = -5$

**Simplify by combining like terms.**

26.  $7x^2 - 8x + 5x - 3 + x^2 - 1$

$7x^2 + x^2 - 8x + 5x - 3 - 1$

$8x^2 - 3x - 4$

27.  $(8x^2 - 7x + 1) + (4x^2 - 10)$

$8x^2 + 4x^2 - 7x + 1 - 10$

$12x^2 - 7x - 9$

28.  $(8x^2 - 4x - 3) + (-10x^2 + x + 5)$

$8x^2 - 10x^2 - 4x + x - 3 + 5$

$-2x^2 - 5x + 2$

1. Write the equation ( $y = A(1 + r)^t$ ) that represents this:

You put \$500 into an account that earns 4% interest a year.  
 $A = 500$        $.04 = r$

$$y = 500(1 + .04)^t$$

2. Write these numbers in scientific notation:

a. 12,500

$$1.25 \times 10^4$$

b. 0.000045

$$4.5 \times 10^{-5}$$

Simplify (write w/ positive exponents):

$$3. \frac{x^{10}}{x^2} = x^{10-2} = x^8$$

$$4. x^{10} \cdot x^3 = x^{10+3} = x^{13}$$

$$5. (x^4)^3 = x^{4 \cdot 3} = x^{12}$$

$$6. (-7x^3)^2 = (-7)^2 x^{3 \cdot 2} = 49x^6$$

$$7. \frac{x^7}{x^{11}} = x^{7-11} = x^{-4} = \frac{1}{x^4}$$

$$8. \frac{12x^{12}}{2x^2} = 6x^{12-2} = 6x^{10}$$

$$9. \frac{24x^5y^3}{3x^2y^8} = 8x^{5-2}y^{3-8} = 8x^3y^{-5} = \frac{8x^3}{y^5}$$

$$10. (-8x^5)(2x^7) = -8 \cdot 2 x^{5+7} = -16x^{12}$$

$$11. 4^{-3} = \frac{1}{4^3} = \frac{1}{64}$$

$$12. \frac{1}{5^{-2}} = \frac{1}{\frac{1}{5^2}} = \frac{5^2}{1} = 25$$

Quadratics:

Multiply the binomials and write the resulting polynomial in standard form:

$$13. (x-7)(x+4) = x^2 + 4x - 7x - 28 = x^2 - 3x - 28$$

$$14. (2x-1)(6x-7) = 12x^2 - 14x - 6x + 7 = 12x^2 - 20x + 7$$

$$15. (x-2)(x+2) = x^2 + 2x - 2x - 4 = x^2 - 4$$

$$16. (x+3)^2 = (x+3)(x+3) = x^2 + 3x + 3x + 9 = x^2 + 6x + 9$$

Factor these polynomials.:

$$17. x^2 - 49 = (x-7)(x+7)$$

$$18. x^2 + 12x + 36 = (x+6)(x+6) \quad \begin{array}{r} 36 \\ 9 \cdot 4 = 36 \\ 6 \cdot 6 = 36 \end{array}$$

$$19. x^2 - 8x + 16 = (x-4)(x-4) \quad \begin{array}{r} 16 \\ 4 \cdot 4 = 16 \end{array}$$

$$20. x^2 + 7x + 12 = (x+3)(x+4) \quad \begin{array}{r} 12 \\ 3 \cdot 4 = 12 \end{array}$$

$$21. x^2 - 5x + 6 = (x-3)(x-2) \quad \begin{array}{r} 6 \\ 3 \cdot 2 = 6 \\ -3 \cdot -2 = 6 \end{array}$$

$$22. x^2 - 2x - 15 = (x-5)(x+3) \quad \begin{array}{r} -15 \\ -3 \cdot 5 = -15 \end{array}$$

$$23. 2x^2 - 7x + 3 = (2x-1)(x-3) \quad \begin{array}{r} 6 \\ 2 \cdot 3 = 6 \\ -6 \cdot -1 = 6 \end{array}$$

$$24. 3x^2 - 10x + 8 = (3x-4)(x-2) \quad \begin{array}{r} 24 \\ -6 \cdot -4 = 24 \end{array}$$

### Solve by factoring

25.  $x^2 - 8x - 20 = 0$

$$(x-10)(x+2) = 0$$

$$x=10 \quad x=-2$$

$$\frac{-20}{-10 \pm 2} = -8$$

### Solve using the quadratic formula. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

26.  $x^2 + 5x - 11 = 0$

$$x = \frac{-5 \pm \sqrt{5^2 - 4(1)(-11)}}{2(1)}$$

$$x = \frac{-5 \pm \sqrt{69}}{2}$$

### Probability

27. What's the **probability** of rolling a 4 on a die?

$$\frac{1}{6}$$

28. What are the **odds** of randomly choosing a vowel from:

LOVESUMMER AEIOU

$$\frac{5}{6}$$

29. You have a deck of cards. What is the **probability** that you draw a **three**, put it back, then draw a **face card**?

$$\frac{4}{52}$$

$$\frac{12}{52} = \frac{48}{2704}$$

$$\frac{1}{13} \cdot \frac{3}{13}$$

$$= \frac{3}{169}$$

30. **How many** ways can you give out 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> place to 7 runners in a race?

$$\frac{7}{1^{st}} \cdot \frac{6}{2^{nd}} \cdot \frac{5}{3^{rd}} = 210 \text{ ways}$$

31. **How many** ways can you draw a red OR a queen from a deck of cards?

$$26 + 2 = 28 \text{ cards}$$

red + black queens

32. **How many** different outfits can you make if you have 5 shirts, 2 pairs of pants, and 3 pairs of shoes?

$$5 \cdot 2 \cdot 3 = 30 \text{ outfits}$$

shirts pants shoes